

Application No. 10/849,752
Responsive to the Office Action of March 12, 2007

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The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) A storage device comprising:
a probe; and
a storage medium having a plurality of storage cells, the probe to form a trench in regions of the storage medium corresponding to at least two of the storage cells, wherein the at least two storage cells contain corresponding portions of the trench to store corresponding data bits.
2. (Withdrawn) The storage device of claim 2, wherein the storage medium comprises a storage surface, wherein a storage cell containing a transition between the storage surface and the trench contains a data bit having a first state, and wherein a storage cell containing either a portion of the trench or a portion of the storage surface but not containing a transition between the storage surface and the trench contains a data bit having a second state.
3. (Original) A storage device comprising:
a storage medium having a plurality of storage cells; and
a probe to read from and write to the storage cells, wherein the storage medium includes a first structure and second structure, wherein a first storage cell containing a transition between the first structure and the second structure contains a data bit having a first state, and wherein a second storage cell not including a transition between the first structure and the second structure contains a data bit having a second state.
4. (Original) The storage device of claim 3, wherein the first structure comprises a trench, and the second structure comprises a surface of the storage medium.
5. (Currently Amended) The storage device of claim 3, wherein the first structure has a different physical characteristic than the second structure.

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6. (Currently Amended) The storage device of claim 3 4, wherein the first structure has a different chemical characteristic than the second structure.
7. (Currently Amended) The storage device of claim 3 4, wherein the first structure has a different electronic characteristic than the second structure.
8. (Currently Amended) The storage device of claim 3 4, wherein the probe comprises a nanotechnology probe.
9. (Original) A system comprising:
a processor; and
a storage device coupled to the processor, the storage device comprising:
a probe;
a storage medium having a storage surface, the probe to form a trench in the storage medium, wherein a transition between the trench and the storage surface represents a first storage state, and wherein lack of a transition between the trench and the storage surface represents a second different storage state.
10. (Original) The system of claim 9, wherein the storage medium includes storage cells, a first storage cell being located in a first region containing a first end of the trench, and a second storage cell is located in a second region containing a second end of the trench, each of the first and second ends constituting a transition.
11. (Original) The system of claim 10, wherein a third storage cell is located in a third region containing a portion of the trench, and a fourth storage cell is located in a fourth region containing a portion of the storage surface of the storage medium away from the trench.
12. (Original) The system of claim 11, wherein each of the first and second storage cells stores a respective data bit having the first storage state, and each of the third and fourth storage cells stores a respective data bit having the second storage state.

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13. (Original) The system of claim 9, further comprising read circuitry to detect engagement of the probe with a transition between the trench and the storage surface.

14. (Original) The system of claim 13, wherein the probe has a tip, the probe tip and the storage medium moveable with respect to each other to enable the probe tip to engage the storage surface, the trench, and any transition between the trench and the storage surface.

15. (Original) The system of claim 14, wherein the probe tip is adapted to form the trench during a write operation.

16. (Original) The system of claim 15, wherein the probe tip is adapted to form a second trench in the storage medium during the write operation, a transition between the second trench and the storage surface to represent the first storage state.

17. (Original) The system of claim 16, further comprising: an encoder to encode input data to produce encoded data; and write circuitry to cause the probe to write the encoded data to the storage medium by forming at least the trenches in the storage medium.

18. (Original) The system of claim 17, wherein the encoding performed by the encoder causes each of the trenches to have greater than a predetermined length.

19. (Original) A method of storing data in a storage device, comprising:
forming, with a probe, a first structure in a storage medium, the storage medium further comprising a second structure;
indicating a first data state in response to detecting a transition between the first structure and the second structure in a first storage cell; and
indicating a second data state in response to detecting lack of transition between the first structure and the second structure in a second storage cell.

20. (Original) The method of claim 19, wherein the first structure comprises a trench, and the second structure comprises a surface of the storage medium, wherein

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forming the trench comprises heating a temperature of a tip of the probe to greater than a write temperature to cause a portion of the storage medium to melt.

21. (Original) The method of claim 20, wherein detecting a transition comprises detecting a transition between the trench and the surface of the storage medium.

22. (Original) The method of claim 20, further comprising:
receiving input write data;
encoding the input write data to produce encoded write data; and
writing the encoded write data to storage cells of the storage medium instead of the input write data, wherein writing the encoded write data to the storage cells comprises writing variable length trenches in the storage medium.

23. (Withdrawn) A storage device comprising:
a probe;
a storage medium having a plurality of storage cells, the probe to form plural variable-length trenches in the storage medium to store data in the storage cells.

24. (Withdrawn) The storage device of claim 23, wherein the plural trenches comprise a first trench and a second trench, the first trench having a first length, and the second trench having a second, different length, wherein the first trench extends through a first number of storage cells, and wherein the second trench extends through a second, different number of storage cells.